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Abstract

This paper describes a research project that explores the factors that contribute to success in the undergraduate information systems major. Personality factors, creativity factors, demographic factors, and cognitive ability factors are included in the analyses. Several hundred current students, grouped as new majors and as graduating seniors, are included in the study. This paper describes the justification for the study and the research design. Some preliminary results are presented showing the personality factors of the sample. More complete results will be presented at the conference.

Introduction

The attrition rate of Information Systems (IS) students concerns many people. By one estimate, fully one third of the students who declare Computer Information Systems (CIS) as a major will not complete the degree program. This trend persists despite the increasing popularity of the major and the high demand for the program's graduates.

Faculty members often discuss various ideas related to identifying the characteristics that contribute to student success in the major (success being defined as either academic achievement in a course, or series of courses, or completion of the CIS degree). The idea being that identification of these factors could lead to better advisement and/or improvements in the curriculum thereby resulting in greater student retention and success rates. This discussion, however, often becomes a debate over what types of factors play a significant role in students' success.

A review of research indicates that certain types or styles of personality and creativity may be associated with success in given areas of academic study and their related professions. This study will attempt to establish a profile of the successful IS student and specifically determine the correlation(s) that exist among personality, creativity, and success in the CIS major.

This study is designed to (1) assess CIS students' personality type; (2) assess the level and types of creativity found among majors; (3) collect other data related to student characteristics; and (4) determine the relationships that exist between these data and success in the CIS major. In this manner, it may be possible that efforts aimed at increasing student retention and success in the major may be made more effective through the information gained from the research.

Prior Research

A review of research indicates that a significant number of studies related to student achievement in computer science were performed during the early to mid 1980's. More recent studies, and specifically studies in the field of Computer Information Systems are more limited in number. In one study of some 92 Computer Information Systems students, Carland and Carland (1990) found great diversity among student personality profiles as measured by the Myers-Briggs Type Indicator (MBTI). The MBTI has been one of the most commonly used personality assessment tools. (Myers, & McCaulley, 1985). Unfortunately, this study was simply an assessment of personality types and given the highly varied scores, no conclusions can be drawn regarding the existence of a typical personality profile. No effort was made to determine whether personality was related to achievement or success in the major.

In a study of the relationship between personality and the specific task of computer programming, Bishop-Clark and Wheeler (1994) found certain aspects of personality type to be positively related to success on certain class assignments. No relationship, however, was found to exist between personality and overall course achievement nor was any effort made to determine whether a common profile existed for successful students.

Creativity levels of both computer information systems and computer science students were assessed in a study by Wynekoop and Walz (1996). The results of this research indicate that students in the two majors tended to have higher levels of creativity than the general student population. Interestingly enough, though, creativity levels among students completing their course of study were the same as or even lower than those of entering majors.

In an earlier study, one aspect of personality (identified as cognitive style) was found to have a limited relationship with achievement in a single computer course according to Evans and Simkin (1989). Again, as in more recent studies, no attempt

was made by these researchers to develop broader knowledge of the characteristics of successful CIS majors or to relate personality to persistence or success in a series of courses or completion of the CIS degree.

Given the limited number and scope of the recent studies in the field, it would appear entirely appropriate to pursue a study whose purpose is to identify a profile of the successful CIS student. An investigation of the relationship among the factors of personality type, creativity level, and other demographic characteristics could prove valuable to the students, to faculty teaching and advising them, and to their furture employers.

Research Design and Methods

This research will draw on the 700 students who have declared CIS majors at Southwest Missouri State University. The focus will be on two segments of this group of students: those recently entering the major (largely sophomores) and those students completing the majors (seniors).

There are approximately 300 students who enroll in the first class in the major core each year, the majority of these students having recently selected CIS as a major. Most of the students completing the major and about to graduate will be enrolled in a capstone project course each year, totaling about 120 students per year. Using these students as study subjects, two different assessment instruments will be used to assess (1) personality type and (2) type and level of creativity that exist among the students. A group of questions designed to identify student demographic characteristics will also be given (self-reported GPA, or ACT score, for example).

The Myers-Briggs Type Indicator (MBTI) will be the instrument utilized to assess personality. This is an instrument widely known, utilized and repeatedly validated as an appropriate means of assessing personality. The Myers-Briggs test has been used extensively in both academic and business settings and profiles for certain occupations have been established (Myers & McCaulley, 1985; Jacobson, 1993; Bishop-Clark & Wheeler, 1994).

Although possibly less well known than the MBTI, the Kirton Adaption-Innovation (KAI) Inventory is an instrument that has also been utilized in both business and academic environments to assess creativity. The KAI distinguishes between two types of creative personalities known as adaptors and innovators. Adaptors, for example would possess the characteristics of "…precision, reliability, efficiency, methodicalness, prudence, discipline, conformity" (Kirton, 1994, p. 10). Innovators would, then, be characterized as "… undisciplined, thinking, tangentially approaching tasks from unsuspected angles" (Kirton, 1994, p. 10). Research using the KAI has indicated that certain types of creativity might be more appropriate for specific tasks and types of tasks found in given academic endeavors and business professions. (Foxall & Payne, 1989; Riley, 1993; Prather, 1994).

The data analysis will consist primarily of correlational studies performed on the variables associated with creativity and personality and factors related to success in the major (GPA in the major, grade in a course). Additional analyses will be performed in order to investigate the relationship(s) that may exist between certain demographic variables and personality/ creativity variables or success variables. Although not an experimental study, consideration will be given to use of analysis of variance (ANOVA) to investigate differences between the entering group of students and those students graduating from the CIS program.

Some Initial Data

Data was collected from approximately 200 study participants, the subjects being students enrolled in current Information Systems course offerings. Initial analysis of scores from the Myers-Briggs Type Indicator (MBTI), reveal some consistency in the pattern of distribution of the various personality profiles. The two most frequently occurring profiles were ESTJ (Extrovert, Sensing, Thinking, and Judging) and ISTJ (Introvert, Sensing, Thinking, and Judging). These two profiles describe approximately 30% of the tabulated responses (13% and 17% respectively). ESFJ (Extrovert, Sensing, Feeling, and Judging) is the profile associated with approximately 10% of the participants. Both the ESFP (Extrovert, Sensing, Feeling, Perceiving) and ENTP (Extrovert, Intuitive, Thinking, Perceiving) were each associated with approximately 8% of the subjects.

Overall, approximately 56% of study participants were identified as Extrovert versus 43% Introvert; 67% were identified as Sensing, 33% Intuitive; 60% identified as Thinking, as opposed to 40% Feeling; 57% identified as Judging, with 43% identified as Perceiving.

The KAI scores for creativity style appeared to be normally distributed with a mean of 93.8 and standard deviation of 14.87. The median and mode of the KAI scores were 93 and 92, respectively. The minimum and maximum scores were 62 to 130, and scores above 96 are considered innovators.

Expected Contribution of this Research

Prior research indicates that student characteristics in terms of creativity and personality may not be altered by academic experiences. Therefore, we should not expect to be able to change students to make them more successful. With the information gained from this study, however, we might be able to modify students' academic experience to better accommodate personality

and creativity styles (much as learning styles must be accommodated) and thereby allow more students to be successful in their pursuit of an CIS degree.

Obviously, though, this study is simply a first step in the investigation of factors possibly associated with academic success. Once completed, additional studies possibly of an experimental nature, should be considered. For example, depending upon the results of this study, a follow-up study could be performed in an attempt to determine if success rates could be manipulated for students with "non-traditional" personality or creativity profiles through the use of altered instructional techniques or experiences.

If as a discipline we can someday begin to positively affect the success rates of students by modifying curriculum and/or the advisement process then the resulting benefit to academic programs and the Information Systems profession would be significant.

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